Hemicellulose influence on cellulose supramolecular structure and material properties

Nanostructural study by solid state NMR spectroscopy

Solid state CP/MAS $^{13}\text{C}$-NMR

Provides detailed information of the cellulose molecular ordering in the fibril

Synopsis

Compression molding of commercial sulfite pulps at high pressure (45 MPa) and high temperature (above 150°C) results in strong and stiff composite materials, whereas kraft pulp yields a softer material.

Cellulose fibril aggregation has been studied by solid state CP/MAS $^{13}\text{C}$-NMR showing that the content of enzyme inaccessible hemicellulose shall be low in order to achieve cellulose fibril aggregation and hence superior stiffness of the compression molded material.

REFERENCES


CONTACT INFORMATION

1 Wallenberg Wood Science Center
The Royal Institute of Technology
Chalmers University of Technology
SE-100 44 Stockholm, Sweden

2 INNVENTIA AB
PO Box 5604
SE-114 86 Stockholm, Sweden

3 Department of Engineering Sciences
Uppsala University
Box 524, SE-751 21 Uppsala, Sweden

Telephone: +46 8 676 7253
E-mail: helena.nilsson@innventia.com

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